

CLAIMS

1. A method of defining an uplink transmission frame timing, for use in a mobile communications system in which a user equipment may have radio links with a plurality of cells, and in which the cells with which the user equipment has radio links define an active set, wherein the uplink transmission frame timing is defined with reference to the downlink transmission frame timing of a reference cell selected from said active set,
- the method comprising:
- when the reference cell is removed from the active set, defining a virtual reference cell, the timing of which is defined with reference to one or more of the cells remaining in the active set, such that the timing of the virtual reference cell corresponds to the timing of the previous reference cell; and
- defining the uplink transmission frame timing relative to the timing of the virtual reference cell.
2. A method as claimed in claim 1, wherein the uplink transmission frame timing is defined to be a fixed time after the virtual reference cell timing.
3. A method as claimed in claim 2, for use in UMTS, wherein the uplink transmission frame timing is defined to be  $T_0$  ( $=1,024$  chips) after the virtual reference cell timing.
4. A method as claimed in claim 1, wherein the virtual reference cell timing is defined with reference to the active cell which first joined the active set.
5. A method as claimed in claim 1, wherein the virtual reference cell timing is defined with reference

to the active cell whose downlink transmission timing most closely corresponds to the downlink transmission timing of the previous reference cell.

5           6.     A method as claimed in claim 1, wherein the virtual reference cell timing is defined with reference to the active cell from which the strongest signal is being received.

10           7.     A method as claimed in claim 1, wherein the virtual reference cell timing is defined with reference to the average timing of all of the cells in the active set.

15           8.     A mobile communications device, for use in a mobile communications system in which a mobile communications device may have radio links with a plurality of cells, and in which the cells with which the device has radio links define an active set,  
20           wherein the device comprises means for defining an uplink transmission frame timing with reference to the downlink transmission frame timing of a reference cell selected from said active set, and

              wherein the device is adapted, when the reference  
25     cell is removed from the active set, to:

              define a virtual reference cell, the timing of which is defined with reference to one or more of the cells remaining in the active set, such that the timing of the virtual reference cell corresponds to the timing  
30     of the previous reference cell; and to

              define the uplink transmission frame timing relative to the timing of the virtual reference cell.

              9.     A mobile communications device as claimed in  
35     claim 8, wherein the uplink transmission frame timing

is defined to be a fixed time after the virtual reference cell timing.

10. A mobile communications device as claimed in  
5 claim 8, for use in UMTS, wherein the uplink transmission frame timing is defined to be  $T_0$  (=1,024 chips) after the virtual reference cell timing.

11. A mobile communications device as claimed in  
10 claim 8, wherein the virtual reference cell timing is defined with reference to the active cell which first joined the active set.

12. A mobile communications device as claimed in  
15 claim 8, wherein the virtual reference cell timing is defined with reference to the active cell whose downlink transmission timing most closely corresponds to the downlink transmission timing of the previous reference cell.

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13. A mobile communications device as claimed in claim 8, wherein the virtual reference cell timing is defined with reference to the active cell from which the strongest signal is being received.

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14. A mobile communications device as claimed in claim 8, wherein the virtual reference cell timing is defined with reference to the average timing of all of the cells in the active set.

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